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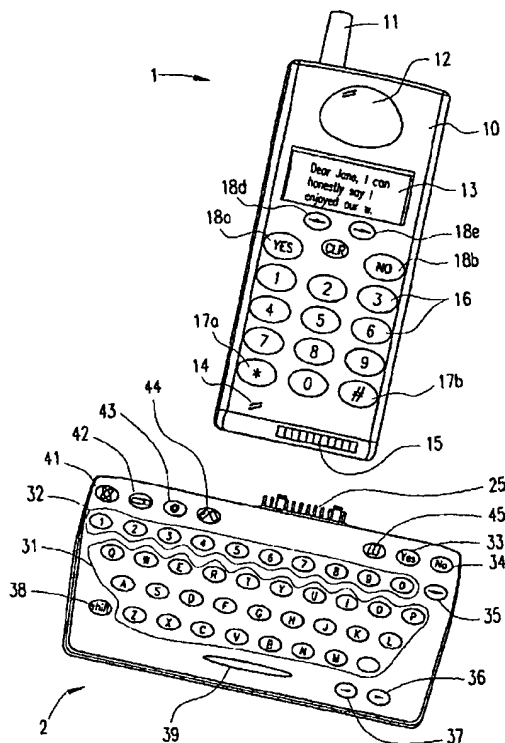
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[Continued on next page]

(54) Title: ACCESSORY BOARD WITH SMART CARD READER FOR A PORTABLE RADIO TELEPHONE



(57) Abstract: An apparatus for providing card data to a radio telephone includes a card reader for containing a transaction card containing various types of card data. The card reader reads the card data and forwards this information to a controller which in response thereto, forwards signals to an attached radio telephone representing the received card data. The apparatus is connected to the radio telephone via a connector which enables the apparatus to be detached and reconnected with the radio telephone.

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ACCESSORY BOARD WITH SMART CARD READER FOR A PORTABLE RADIO TELEPHONE

BACKGROUND OF THE INVENTION

Technical Field of the Invention

The present invention relates to the mobile communications field, and more particularly, to a keyboard attachment to a portable radio telephone that includes a card reader for reading cards such as credit cards, smart cards, bank cards, loyalty cards and driver's licenses.

Description of Related Art

Smart cards are used for a variety of applications, including Subscriber Identity Module (SIM) cards in cellular phones, cash cards for banking, loyalty cards, identification cards, etc. Certain smart cards are reprogrammable, such as Java cards and MULTOS cards. Descriptions of such smart cards can be found on the World-Wide Web at "The Java Card Forum," and "www.multos.com." As such, most smart cards available today are used to store single applications. However, certain smart cards like MULTOS and Java cards exist that can store several applications (e.g., multi-application cards).

Most persons' wallets carry numerous types of cards for different services, such as, for example, credit cards, bank cards, loyalty cards, drivers licenses, etc. As such, multi-application cards would be useful to incorporate some of these services on the same card. Although such a capability provides an opportunity to reduce the number of cards carried in a wallet, it is not likely to be implemented soon. For example, competing companies would not likely to agree to have their services provided by the same card, even if such a card provides an excellent opportunity for a company to increase the exposure of its name and logo. In other words, such a card would be useful for "branding" purposes.

The existing cards are being used for single applications. For example, one card is used as a credit card, another is used for debit or loyalty applications, etc. Also, most existing cards also employ magnetic stripes to make transactions. These cards can be used directly at the sellers' locations, where they can be read by a magnetic stripe reader, or indirectly via a phone or the Internet by relaying the card number to the seller.

In the near future, most magnetic stripe cards will be replaced by smart cards. Albeit, in some countries (e.g., France and Belgium), these replacements have already

occurred. For example, the so-called "Proton" card is a smart card that stores electronic "cash". In fact, pilot projects using electronic cash cards have been conducted all over Europe.

5 As such, in order to store electronic "money" on such a cash card, a user can visit an Automated Teller Machine (ATM), or establish an electronic connection with a bank via a processor equipped with a card reader. In the latter case, if a mobile phone were to be equipped with a smart card reader, this electronic "money" could be stored in the phone from anywhere (e.g., a "wireless wallet").

10 This problem can be best illustrated by the following example. When a customer purchases an airline ticket at a counter, the ticket agent may request the customer's credit card and frequent flyer card. These cards or their account numbers are then read in or keyed in, and their respective accounts are updated to reflect the completed transaction. The read in operations are typically performed with a card reader at the ticket counter.

15 Alternatively, the cards' information can be provided to an agent over the phone. In that case, the customer states the card account numbers and expiration dates to the agent over the phone. Normally, the agent does not request authorization/authentication information from the customer over the phone, and the cards do not maintain "files" that can be updated to reflect the transactions made. Consequently, if an unauthorized user obtains a valid customer's credit card account number, the user can deplete the account over the phone in a relatively short time.

20 One way to improve the security of credit card transactions would be to use smart cards instead of magnetic stripe cards. For example, a Personal Identification Number (PIN) code could be required to allow access to account information stored on a card. Such a PIN code should provide adequate user authentication protection. However, it is not possible to make a smart credit card purchase over existing phones, because the information stored on the smart card has to be accessed and checked electronically. Nevertheless, as described in detail below, the present invention of a cash board employed with a mobile phone successfully resolves this problem and other related problems.

SUMMARY OF THE INVENTION

The present invention overcomes the foregoing and other problems with an apparatus for providing card data to a radio telephone. The apparatus includes the card reader for containing a card such as a smart card, credit card, bank card, etc. for reading
5 the information stored on the card. A controller receives the information read by the card reader and forwards signals representing the received information to the radio telephone. The information is transmitted directly to the radio telephone via a connector which enables the apparatus to be detachably connected to the radio telephone. The controller transmits the information to the radio telephone via a transceiver enabling serial
10 communications between the apparatus and the radio telephone such as a universal asynchronous receiver transmitted (UART).

In one embodiment, the card reader may further be implemented within an accessory keyboard containing a plurality of alphanumeric keys. In this embodiment, a controller generates signals to the radio telephone in response to information read by the
15 card reader and in response to keystrokes on the plurality of alphanumeric keys.

In another embodiment, the card reader may be interconnected with a controller via a wireless connection, for example, any of the normal cellular communication protocols may be used or short range wireless protocols such as the Bluetooth system may be used.

20 BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the method and apparatus of the present invention may be obtained by reference to the following Detailed Description when taken in conjunction with the accompanying Drawings wherein:

FIGURE 1 illustrates a portable radio telephone in a detachable accessory
25 keyboard including a card reader according to the preferred embodiment of the invention;

FIGURE 2 is an illustration of a backside of the accessory keyboard of FIGURE
1.

FIGURE 3 is a schematic block diagram of a printed circuit board implemented within the keyboard of the present invention;

30 FIGURE 4 is an alternative embodiment of the invention illustrated in FIGURE 3; and

FIGURE 5 is yet another embodiment of the invention in FIGURE 3.

DETAILED DESCRIPTION

Referring now to the drawings, and more particular to FIGURE 1, there is illustrated a portable radio telephone 1 together with an accessory keyboard 2 according to a preferred embodiment of the invention. For the rest of this specification, the portable radio telephone 1 will be exemplified by, and referred to as, a mobile GSM telephone. However, mobile phones of any type may be used. The mobile telephone 1 is per se essentially known from the prior art and comprises an apparatus housing 10, an antenna 11 mounted on top of the housing, a loudspeaker 12 provided in an upper front portion of the housing, a visual display 13 and a microphone 14, which also are provided at the front portion of the apparatus housing 10. Moreover, the mobile telephone 1 comprises an ordinary numeric telephone keypad having a plurality of numeric keys 16, each of which represents a respective digit 0 through 9. A * key and a # key 17a, 17b are also provided and have ordinary functions.

The keypad also comprises a YES key 18a, which in a conventional way is used, e.g., for answering an incoming call, or for performing an affirmative action in any routine or option provided by the man-machine interface of the mobile telephone 1. A NO key 18b similarly has a function for providing a negative response to any such function within the man-machine interface. It will also be used in an ordinary way for terminating an ongoing call. Moreover, it may be used as a power-on key for turning on the mobile telephone 1.

The telephone keypad also comprises a clear key 18c, which for instance may be used for resetting the man-machine interface to an initial state (escaping from any option within a menu system provided by the man-machine interface), and arrow keys 18d, 18e, which are used for scrolling through different options in the man-machine interface.

The mobile telephone 1 also comprises, at a lower end of the apparatus housing 10, an accessory connector, which may be used for connecting the mobile telephone 1 to any commercially available accessory device, such as a hands-free set or a battery charger.

The lower portion of FIG. 1 discloses a novel accessory keyboard 2 having an external connector 25 to be detachably inserted in the accessory connector 15 of the

mobile telephone 1. The accessory keyboard 2, which is illustrated in more detail in the remaining figures, comprises a plurality of alphabetic character keys 31, including the keys A through Z of the normal English alphabet, as well as a dot character. A plurality of numeric keys 32 represent the digits 0 through 9 and are provided above the alphabetic
5 keys 31. A YES key 33 and a NO key 34 are provided at the uppermost right corner of the front surface of the keyboard. A backspace/clear key 35 is provided immediately below the No key 34. Moreover arrow keys 36 and 37 are provided at the lowermost right corner of the accessory keyboard 2. The YES key 33, NO key 34, backspace/clear key 35 and arrow keys 36-37 will all have the same function, as if the corresponding key
10 would have been pressed on the ordinary telephone keypad 16-18.

A shift key 38 is provided next to the plurality of alphabetic keys 31 and is used in a manner known per se for toggling the function of each alphabetic key 31 between the character value printed on the face of the key (for instance K) and another character, such as the Nordic character Ö. The shift key 38 may also be used for toggling the
15 function of the numeric keys 32 between for instance 1 and !.

At the lower portion of the accessory keyboard 2 a space key 39 is provided. Finally, a plurality of function keys 41-45 are provided at the uppermost portion of the accessory keyboard 2. More particularly, the function keys comprise a website command key 41, an attachment key 42, an email key 43, an SMS key 44 and a phonebook key 45.

20 In the following, the various different keys 31-45 will be commonly referred to as "alphanumeric keys".

The accessory keyboard 2 according to the preferred embodiment is particularly well suited for use as a tool for accessing a novel website by submitting email messages and certain website control commands embodied in a standard SMS message. Therefore,
25 when the SMS key 44 is pressed, the logic circuitry inside the accessory keyboard (shown in more detail in FIG. 3 will form a digital control signal, preferably in the form of an AT command sequence, which contains a sequence of commands that will cause the mobile telephone 1 to enter an option for generating and sending an SMS message in the man-machine interface of the telephone 1. In other words, striking the SMS key
30 44 will cause the mobile telephone 1 to enter its menu option for sending an SMS message, and the user will be provided with an empty display 13 having a blinking

cursor, which indicates that the mobile telephone 1 is ready to receive an entered text message character by character.

Similarly the phonebook key 45 will invoke another option in the man-machine interface of the mobile telephone 1, viz. an option for entering the electronic telephone
5 book thereof.

The email key 43 will invoke the same option as the SMS key 44, i.e., the menu option for sending an SMS message. In addition, the characters "To:" will be automatically inserted at the beginning of the text message to be entered by the user. Hence, the user is given the opportunity to specify an Internet email address immediately
10 following the header "To:" and then enter the actual text message. Once the message is completed, the user will press the YES key 18a, and the entered email message will be encapsulated in a standard SMS message, which is sent to a predetermined telephone number. This telephone number is assigned to a specific gateway of the aforesaid website, and the gateway will recognize the incoming SMS message as being in fact an
15 email message, since it begins with the characters "To:". Consequently, the gateway will extract the email address, which was entered immediately following the characters "To:", create an empty email message having as its destination the extracted email address, and then generate an email body from the rest of the characters of the received SMS message. The website and the various functions and features thereof are disclosed in a separate
20 patent application, having the title "Website Being Accessible for Users of Portable Communication Devices", which was filed by the same applicant on the same date as the present application, and which is fully incorporated herein by reference.

In the email mode described immediately above, the attachment key 42 will generate the characters "#:" in the text message currently being input by the user. The
25 user may enter the file name of any computer file, which has been stored in advance at the website.

The website command key 41 will invoke the above mentioned menu option for sending an SMS message and will also generate the characters "WWW:" at the beginning of the message. The user may enter a website control command following these
30 characters. Such website control commands are described in detail in the above-referenced co-pending patent application and include a command for adding a specified user to a mailing list stored at the website, a command for deleting a user from such a

mailing list, a command for setting information in a personal information field stored at the website, a command for setting a status field related to the user of the mobile telephone 1 and stored at the website, and a command for setting a location field stored at the website.

5 The connector 25 comprises a plurality of connecting members or pins 25a as well as two engagement members 25b, the purpose of which is to mate with corresponding engagement recesses in the accessory connector 15 of the mobile telephone 1. The individual connecting members 25a have predetermined electrical functions as signal lines or power supply lines. More specifically, two of the connecting
10 members 25a are power supply pins, which are adapted to engage with corresponding contacts of the accessory connector 15, thereby receiving electric power from the power source (battery) of the mobile telephone 1. Consequently, the accessory keyboard 2 of the preferred embodiment has no internal power source but receives all necessary electric power from the mobile telephone 1. Other connecting members 25a have the purpose
15 of acting as serial communication lines, reference voltage lines etc.

 Referring now to FIG. 2, there is illustrated a backside of the accessory keyboard 2. The backside of the accessory keyboard 2 includes a slot 200 for accepting a smart card (not shown). The slot 200 provides access to a card reader 205 located within the accessory keyboard housing and shown generally in hidden lines. The card reader 205
20 may read magnetic (magnetic card reader) or electronic data (smart card reader) off of a card inserted within the slot 200 enabling the accessory keyboard 2 to pass information stored on the card to the mobile telephone 1 through the connector 25.

 While only a single slot 200 and card reader 205 are illustrated in FIG. 2, it is also possible to have multiple slots 200 and multiple card readers 205 to enable the reading
25 of information from more than one card at a time. Alternatively, a single slot 200 may act as a port for interconnecting with a smart card wallet (not shown) holding single or multiple smart cards as more fully described in U.S. Patent Application 08/139,552 entitled "Smart Card Wallet" filed on September 25, 1998, whose disclosure is incorporated herein by reference. In this way, information from the smart card wallet
30 may be transmitted to the accessory board 2 and onward to the mobile telephone 1 when the smart card wallet is inserted within the slot 200 and interconnected with the keyboard assembly 2 via some type of connection mechanism.

Referring now to FIG. 3, a schematic illustration of a printed circuit board 300 is given. The printed circuit board 300 is mounted within housing of the accessory keyboard 2. A central controller 310 has the main responsibility for controlling and performing the functionality of the accessory keyboard 2. In the preferred embodiment, the controller 310 is implemented by a programmable microprocessor of any commercial type. The controller 310 is connected to a keystroke detector circuit 320, which has the purpose of detecting when the user strikes an individual key among the plurality of alphanumeric keys 31-35, and forwarding this information to the controller 310.

Moreover, the printed circuit board 300 comprises an electronic memory 330 for storing program instructions to be executed by the controller 310, and also reference data to be used for identifying individual keys as well as selecting the correct AT command sequence to be submitted to the mobile telephone 1 in response to the detection of a particular keystroke. The memory 330 may be implemented by any commercially available electronic memory, such as an EEPROM memory and/or a RAM memory. Moreover, it may advantageously be integrated with the controller 310, particularly if the latter is realized as a programmable microprocessor.

According to the preferred embodiment, the accessory keyboard 2 communicates with the mobile telephone 1 over a serial communication interface at a rate of 9600 bps. Therefore, the printed circuit board 300 is provided with a transceiver for performing serial communication with the mobile telephone 1. In the preferred embodiment the transceiver 340 is realized as a Universal Asynchronous Receiver Transmitter (UART). The transceiver 340 is connected to the connector 25 of the accessory keyboard 2.

A card reader 205 interconnects with the controller 310 via a local bus 350. The card reader 205 comprises a conventional smart card or magnetic card reader including plug and play input/output connections for conveying data to/from a card. In this regard, such a reader is actually a "reader/writer". The controller 310 may be reconfigured such that the smart card readers 345 may read various types of smart cards or even be reprogrammed to add additional smart cards to the card readers.

A predetermined protocol enables the transmission of information between the card reader 205 and the controller 310 over the local bus 350 such that information from the smart card may be transmitted to the mobile phone 1 through the transceiver 340 and connector 25. As with the keystrokes entered via the keyboard 2, the information read

by the card reader 205 may be transmitted from the mobile telephone 1 via SMS messages.

5 In an alternative embodiment illustrated in FIG. 4, the printed circuit 300 of the present invention includes a plurality of cards readers 325 that are attached to the controller 310 via a local bus 350. This enables a plurality of cards to be accessed by the accessory keyboard 2 at any one time. The local data bus 350 can comprise a local Internet Protocol (IP)-based network. In other words, each smart card reader 345 has its own IP address. As such, each smart card within a reader 345 can be addressed separately via, for example, the Internet or otherwise by using the individual IP
10 addresses. Consequently, the present invention can be utilized to provide other technical advantages.

For example, the services and/or resources available on different smart cards can be invoked by using Remote Procedure Calls (RPCs). Also, if using smart cards with applications programmed in JAVA (object-oriented), certain objects can be accessed on
15 those cards by using the Remote Method of Invocation (RMI). Furthermore, a remote device (e.g., terminal, phone, etc.) in communication with the accessory keyboard 2 can be equipped with additional functionality, which enables the device to communicate with a plurality of different IP-based networks. Additionally, by using an IP-based network for the data bus, a Secure Socket Layer (SSL) can be used to secure the transport of
20 sensitive data to and from the card reader. In this regard, the present invention can employ a math processor (not shown), which can be used for data encryption/decryption purposes (e.g., employing RSA, DES, etc.). In fact, such a math processor can also be used for an embodiment that does not employ IP addresses.

Referring now to FIG. 5, there is illustrated an alternative embodiment of the
25 present invention wherein instead of the card readers 205 residing within the accessory keyboard housing 2, a transceiver device 360 is included enabling the keyboard to access a card reader via a wireless interface. While no smart card readers 370 are illustrated within the keyboard 2, in Figure 5, it should be realized that one or more smart card readers may also be included on the keyboard. This type of connection would be useful
30 with a device including card readers such as a smart card wallet described in corresponding U.S. Patent Application No. 09/139,552 entitled "Smart Card Wallet", filed August 25, 1998 which is incorporated herein by reference. While the following

description is made with respect to a single smart card wallet 365, it should be understood that multiple links with a plurality of smart card wallets may be carried out.

5 The smart card wallet 365 includes one or more smart card readers 370 for containing and reading at least one smart card. The wallet also includes short-range radio/data bus controller 375. Each smart card reader is connected to the radio/data bus controller 375 by a data bus 380. The radio section of the radio/data bus controller 380 is structured to communicate with the transceiver 360 via a relatively short range radio air interface or link 362 (e.g., range of about 10 feet). For this embodiment, the radio link or air interface 13 may compatible with the radio air interface normally established for a mobile phone in a Public Land Mobile Network (PLMN), such as, for example, a network for a typical Global System for Mobile Communications (GSM), Advanced or Digital Advanced Mobile Phone System (AMPS or DAMPS), Personal Digital Cellular (PDC) System, Personal Communications System (PCS), etc. Alternatively, a short range wireless system, such as the Bluetooth system or a Pico Network may also be used.

15 The data bus controller section functions to transfer data to/from the radio section and the plurality of smart card readers 370 via the data bus 380. For this embodiment, the smart card data bus controller section can be a conventional microcontroller with appropriate auxiliary components (e.g., RAM, ROM, I/O, etc.). As such, the microcontroller controls the transfer of data between any one of the smart cards within a smart card reader 370 and the accessory keyboard 2 via the radio link 362. Alternatively, data can be transferred to/from the smart card wallet to a mobile transceiver via, for example, an infrared (IR) link (e.g., the radio section is replaced with an IR transmitter/detector section), or a wireline connection can be made directly to a data connector on the keyboard.

25 The following is an example of how the accessory keyboard 2 can be used, in accordance with a preferred embodiment of the present invention. Assume that a customer contacts an airline's reservation service representative by phone (mobile or fixed phone) and books a flight reservation. In response, the airline representative gives the customer a reference (identification) number for the reservation transaction, and quotes a price for the ticket. In accordance with the preferred embodiment, when the customer pays, the airline for the ticket, the customer uses a mobile phone to mediate the payment transaction.

For example, the customer's mobile phone and the accessory keyboard 2 displays a menu, which includes a listing of applications for each smart card contained in the accessory board 2. The customer selects a smart card from the display (e.g., credit card, pre-paid cash card, etc.) that the customer intends to use to pay for the reserved airline ticket. The customer inputs may be made through either the keyboard or the telephone interface. The customer then enters into the accessory board 2 (e.g., using the alphanumeric keys) a PIN code for the smart card selected for the payment transaction, and the ticket price and reference (identification) number provided by the airline representative. This payment information is stored in local memory 330 or in the cash cards.

An airline representative (or airline computer in an automated payment environment) establishes telephonic communications with the customer's mobile phone 1 via a PLMN (preferably on a data channel). For example, the airline representative (or computer) can place a conventional call to the customer's mobile phone 1 from a fixed telephone or terminal in a Public Switched Telephone Network (PSTN). The airline representative or computer inputs/transmits data containing a predefined code to the customer's mobile phone (1), which requests the mobile phone to transmit valid transaction information (e.g., an electronic "receipt") to confirm the payment transaction. For example, in response to the airline's request for valid transaction information, the mobile phone (1) can transmit information (for reception back at the airline phone or terminal) corresponding to the reference number originally provided for this ticket transaction by the airline representative. The airline can also request valid frequent flyer account information (e.g., frequent flyer account number) for that customer from the mobile phone (1). Once the airline has received the valid transaction information (and, for example, related frequent flyer information), the call between the airline and customer's mobile phone can be terminated.

The mobile phone 1 and keyboard 2 communicate via the connection link. The mobile phone 14 sends a control message to the controller 310, which directs the smart card(s) selected for this transaction. As such, the controller updates the appropriate (credit, cash, etc.) smart card in the card reader 345 to reflect the ticket payment transaction (e.g., subtracts the amount paid from the account balance maintained in the smart card). Also, for this example, the controller 310 section can update the frequent

flyer account information on that selected smart card (e.g., increase the frequent flyer mileage balance accordingly).

5 The previous description is of a preferred embodiment for implementing the invention, and the scope of the invention should not necessarily be limited by this description. The scope of the present invention is instead defined by the following claims.

WHAT IS CLAIMED IS:

1. An accessory keyboard system for a radio telephone, comprising:
a plurality of alphanumeric keys;
a card reader;
a connector for detachably connecting the accessory keyboard system to
5 the radio telephone; and
a controller for detecting keystrokes entered on the alphanumeric keys by
a user and for receiving card data read from a card inserted within the card reader and in
response to the detected keystrokes and received card data forwarding signals to the radio
telephone representing the detected keystrokes and the received card data.
- 10 2. The accessory keyboard system of Claim 1, further comprising a
transceiver device for serial communication with the radio telephone.
3. The accessory keyboard system of Claim 2, wherein the transceiver device
comprises a UART.
4. The accessory keyboard system of Claim 1, wherein the card reader
15 comprises a plurality of card readers.
5. The accessory keyboard system of Claim 4, wherein each card reader has
a separate IP address.
6. The accessory keyboard of Claim 1, wherein the card reader and the
controller have a hardwire connection.
- 20 7. The accessory keyboard system of Claim 1, further comprising:
a transceiver for providing a wireless link between the card reader and the
accessory keyboard system.
8. The accessory keyboard system of Claim 7, further including a remote
controller for providing the wireless link between the card reader and the transceiver.

9. The accessory keyboard system of Claim 7, wherein the transceiver uses the Bluetooth protocol.

10. The accessory keyboard system of Claim 1, wherein the card reader and the accessory keyboard system are interconnected via a Pico Network.

5 11. The accessory keyboard system of Claim 1, wherein the card reader comprises a smart card reader.

12. The accessory keyboard system of Claim 1, wherein the card reader comprises a magnetic card reader.

10 13. The accessory keyboard system of Claim 1, further including the radio telephone connected to the connector and adapted to transmit the forwarded signals to a remote location via a wireless link through a wireless network.

14. An apparatus for providing card data to a radio telephone, comprising:
a card reader for receiving a card containing the card data and for reading card data from the card;
15 a connector for detachably connecting the apparatus to the radio telephone; and
a controller for receiving card data from the card reader and in response thereto, forwarding signals to the radio telephone representing the received card data.

20 15. The apparatus of Claim 14, further comprising a transceiver device for serial communication with the radio telephone.

16. The apparatus of Claim 15, wherein the transceiver device comprises a UART.

17. The apparatus of Claim 14, wherein the card reader comprises a plurality of card readers.

18. The apparatus of Claim 15, wherein each card reader has a separate IP address.
19. The apparatus of Claim 14 wherein the card reader and the controller have a hardwire connection.
- 5 20. The apparatus of Claim 14 further comprising:
a transceiver for providing a wireless link between the card reader and the accessory keyboard system.
- 10 21. The apparatus of Claim 20 further including a remote controller for providing the wireless link between the card reader and the transceiver.
22. The apparatus of Claim 20, wherein the transceiver uses the Bluetooth protocol.
- 15 23. The apparatus of Claim 14 wherein the card reader and the accessory keyboard system are interconnected via a Pico Network.
24. The apparatus of Claim 14 wherein the card reader comprises a smart card reader.
25. The apparatus of Claim 14, wherein the card reader comprises a magnetic card reader.
- 20 26. The apparatus of Claim 14 further including the radio telephone connected to the connector and adapted to transmit the forwarded signals to a remote location via a wireless link through a wireless network.

27. A method for transferring card data from a smart card during a transaction, comprising the steps of:

reading the card data from the transaction card;

transferring the card data to a controller;

5 generating a signal in response to the card data; and

transmitting the signal to a radio mobile terminal.

28. The method of Claim 21, wherein the step of transferring further comprises the step of wirelessly transmitting the card data to the controller.

29. The method of Claim 27, wherein the card data comprises electronic data.

10 30. The method of Claim 27 wherein the smart card comprises a credit card and the card data comprises magnetic data.

1/4

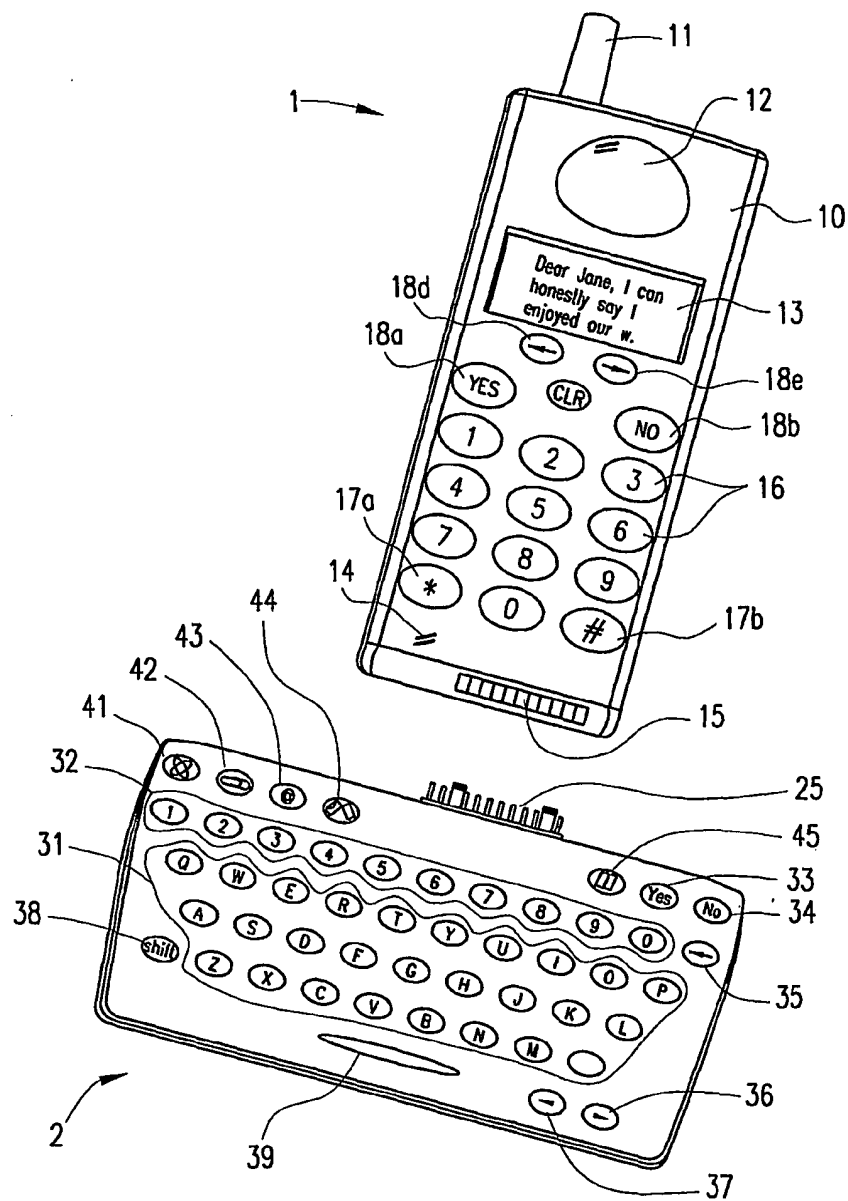
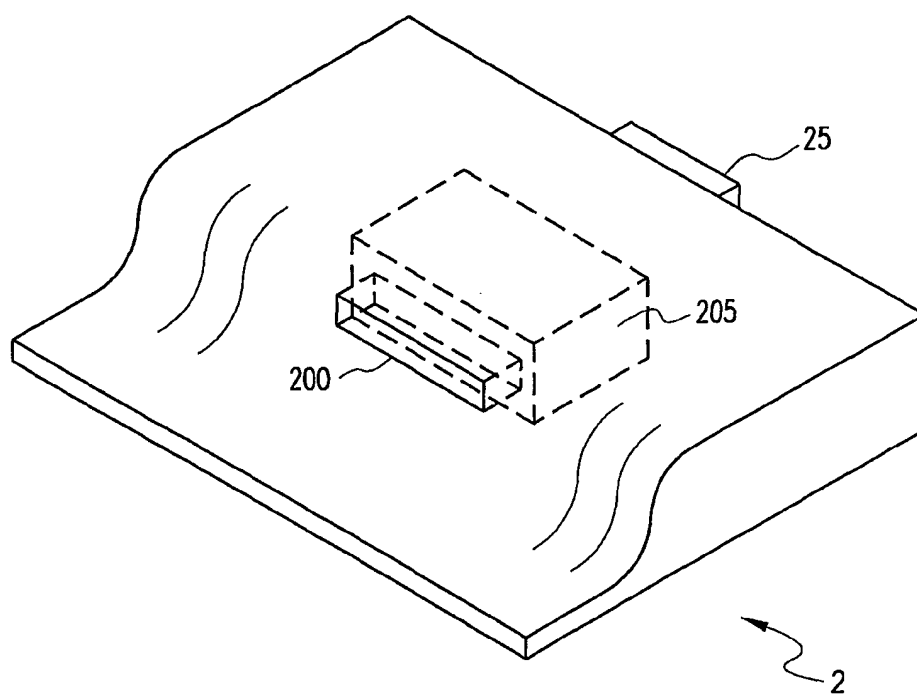


FIG. 1

*FIG. 2*

3/4

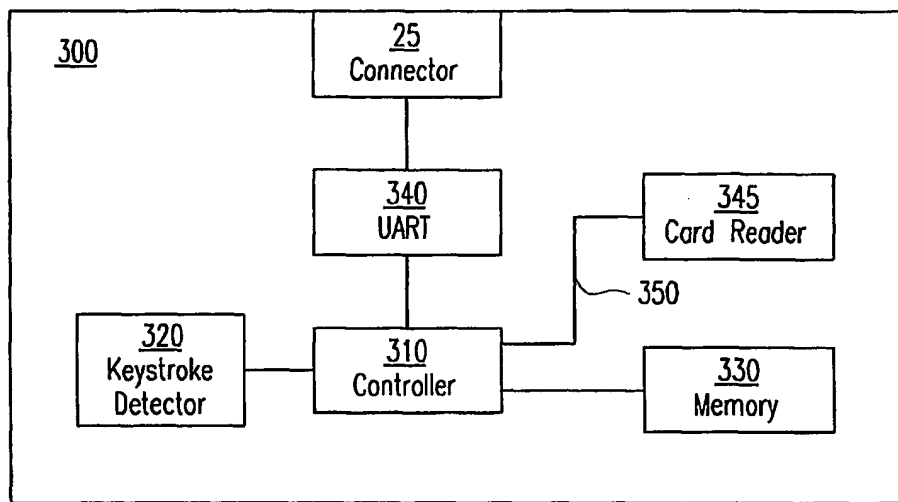


FIG. 3

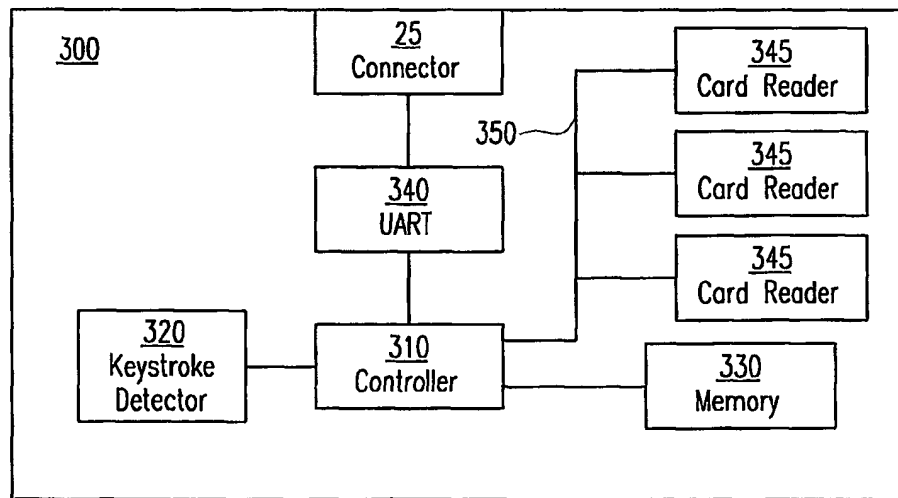


FIG. 4

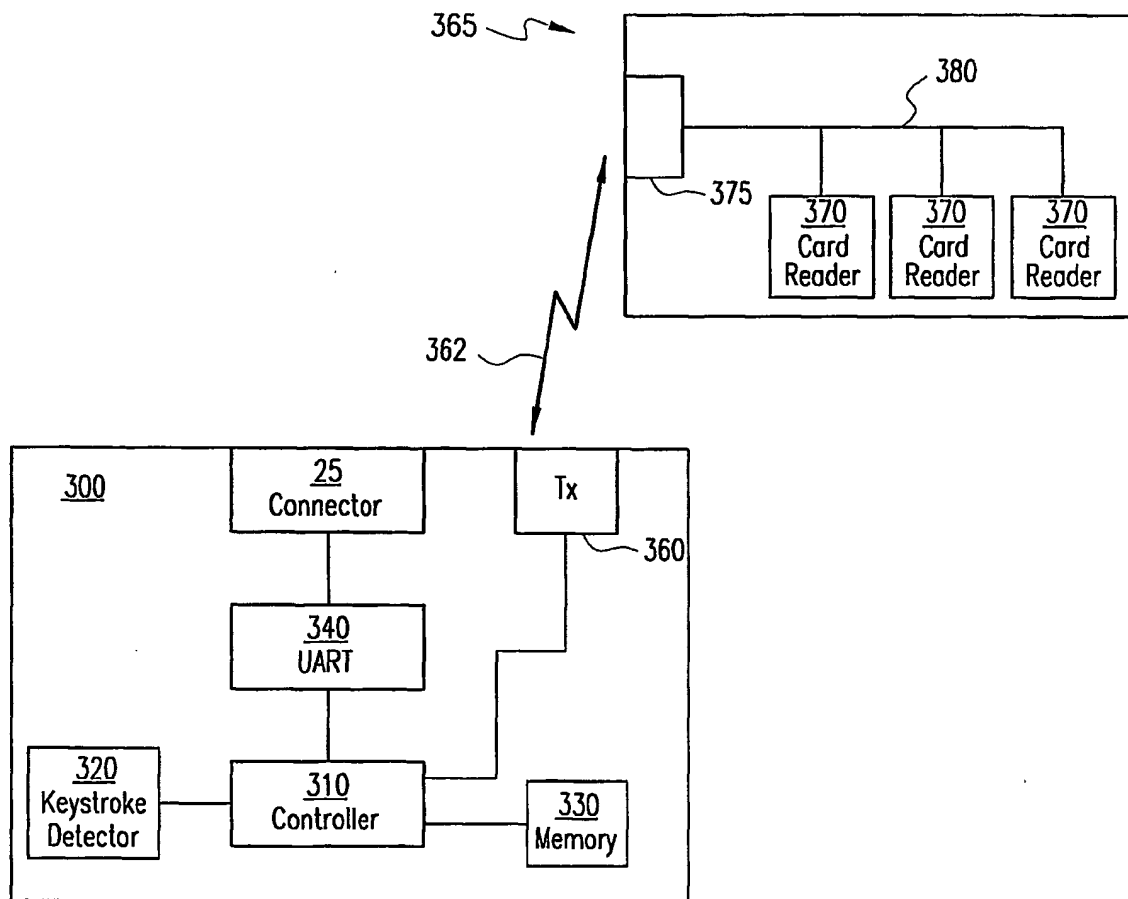


FIG. 5

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 01/01545

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04M1/23 H04M1/02 G07F7/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04M G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 940 783 A (KEYCORP LIMITED) 8 September 1999 (1999-09-08) paragraph '0009! - paragraph '0013! paragraph '0019! - paragraph '0028! claims 1-3; figures 1-3 ---	1,4,6, 11-14, 17,19, 24-27
Y	EP 0 820 178 A (MOTOROLA INC) 21 January 1998 (1998-01-21) column 2, line 29 -column 7, line 7 figures 1,2,5 --- -/--	1,6,7, 11,13, 14,19, 20,24, 26-28

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

14 June 2001

Date of mailing of the international search report

22/06/2001

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 01/01545

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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